

Except for the Apollo missions, NASA's manned spaceflight missions have stayed well below the altitude of the Van Allen belts. However, a part of the inner Van Allen belt dips down to about 200 km into the upper region of the atmosphere over the southern Atlantic Ocean off the coast of Brazil. This region is known as the South Atlantic Anomaly. The dip results from the fact that the magnetic axis of the Earth is tilted approximately 11 degrees from the spin axis, and the center of the magnetic field is offset from the geographical center of the Earth by 280 miles. The largest fraction of the radiation exposure received during spaceflight missions has resulted from passage through the South Atlantic Anomaly. Low inclination flights typically traverse a portion of the South Atlantic Anomaly six or seven times a day.